THERMAL ANALYSIS FOR DETECTION AND IDENTIFICATION
OF EXPLOSIVES AND OTHER CONTROLLED SUBSTANCES
Abstract of the Disclosure

The invention features methods and systems for detecting the presence of an energetic material in a sample in which the presence of the energetic material is unknown. The method includes the steps of: heating the sample; measuring heat flow between the sample and its surrounding environment, e.g., by using differential scanning calorimetry (DSC); and analyzing the measured heat flow between the sample and its surrounding environment. An exothermal peak in the measured heat flow indicates the presence of the energetic material in the sample. The system includes a thermal measuring apparatus for performing the heating and measuring steps, and an analyzer for detecting the presence of the energetic material based on the measured heat flow. The invention also features methods and systems for identifying contraband materials (e.g., explosives and drugs) by measuring the thermogram (e.g., by DSC) of a sample to be identified and comparing it to reference thermograms for known contraband materials.

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